IMPLEMENTING JOINT VISION 2010: IDENTIFYING GATM AS A BASIC NEED

Graduate Research Paper

William Brou Gautier, Captain, USAF

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DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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William Brou Gautier, B.S.

Captain, USAF

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William Brou Gautier

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Abstract

Joint Vision 2010 illustrates a yellow brick road to future warfighting capability that is built on a solid foundation of strategic mobility. At the same time, the global airspace structure is undergoing a fundamental change that will severely limit the United States Armed Forces' ability to carry out the types of air mobility operations *Joint Vision 2010* describes. So, it is incumbent upon the individual services to follow that plan with a bona fide purple acquisition process for all programs required to pave the road. Only in this way can the Department of Defense truly ensure fully capable air mobility operations such that combatant commanders can deter aggression and, if necessary, wage and win war in support of United States national security objectives.

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I. Introduction

Recognizing deficiencies in the way the Department of Defense organized, trained and equipped this nation's fighting forces in light of projected economic and budgeting forecasts, former Chairman of the Joint Chiefs of Staff, John M. Shalikashvili created a vision statement. That effort, *Joint Vision 2010* (*JV 2010*), provides common direction for the services as they develop their unique capabilities within the framework of joint doctrine and programs as they prepare to meet an uncertain and challenging future. One such development is the modernization of the air mobility fleet's communication, navigation and surveillance equipment.

With the exception of the Boeing [McDonnell Douglas] C-17, the air mobility fleet is old and mostly equipped with vintage avionics technology in constant need of repair. The fleet, from the venerable 1950s technology KC-135 Stratotanker to the 1970s technology C-5 Galaxy and KC-10 Extender, faces a mandatory upgrade to all of the avionics due to planned changes in the environment known as the Future Air Navigation System (FANS).

The FANS provides a way of using the massive improvements in computer technology realized over the past thirty years to enhance communication between aircraft and the air traffic control structure and to improve air navigation safety. The International Civil Aviation Organization (ICAO) began phased implementation of the

FANS in March, 1997 with the introduction of reduced vertical separation between aircraft in the most congested airspace in the world, the North Atlantic Region. Reduced Vertical Separation Minima (RVSM) implementation in the Pacific will begin in February of 2000 and over North America and Europe in 2001.

Changing the airspace structure to allow greater numbers of flights safe passage through a given volume of airspace is essential to future air travel needs. That safety is ensured by modern avionics equipment. The absence of this modern equipment means one thing: non-complying aircraft will be excluded from the FANS airspace. That is where this problem begins. Exclusion from the airspace means non-complying aircraft have to go around it, and with global coverage set to begin within the next seven years, the Defense establishment is rapidly running out of time to modify Air Mobility Command's aircraft. Upgrading Air Force aircraft will be expensive and the only alternative to spending the money in the short term is airspace avoidance. Avoiding modified airspace, however, results in longer flight times, reduced payloads, increased fuel costs and extends the amount of time required to close a deploying force. Thus, what appears on the surface as an Air Mobility Command problem, is really a transportation problem common to all air mobility users.

Joint Vision 2010 reflects that in future years, the U.S. military will remain a force that is largely based in the continental United States (CONUS). Power projection from a CONUS garrisoned force, in order to be credible, must rely on rapid strategic mobility. Without a strategic lift force capable of global operations, the credibility of the United States power projection capabilities as well as national commitment could be questioned. Therefore, as *JV 2010* points out, timely response through rapid strategic

mobility is "critical to our deterrent and warfighting capabilities," (19:4-5). Accordingly, in order to deploy as rapidly as possible, the bottlenecks of the transportation pipeline must be widened. That means Air Mobility Command has to upgrade the avionics suites of its aircraft despite the large price tag the modifications command.

Air mobility fleet modernization is not the only program on which to spend decreasing budget dollars, but it is both crucial and urgent. General Shalikashvili indicated mobility's importance when he noted, "If we do not build a transportation system that can meet our needs tomorrow then it doesn't matter much what kind of force we have because we won't be able to get it there" (24:1). This view is reinforced in *Joint Publication 1, Joint Warfare of the Armed Forces of the United States.*

> Transportation enables the joint campaign to begin and continue. The projection of power relies upon the mobility inherent in air, naval, and land forces, supported by the defense transportation system. Transportation at the strategic and operational levels of war is a complex operation...[and] experience has shown that the cooperation of all supporting combatant commands and Services is required to ensure the efficient coordination and execution of a major deployment. (20:Sec IV, 8)

All of the services have mobility requirements and, because the military has transitioned to a primarily CONUS based force, those requirements have increased. This fact, in combination with the changing mobility environments, requires a combined effort by all branches of service to share the burden of fleet modernization.

In a roadmap fashion, this paper will conduct a literature review and background on *JV 2010* and the Global Access, Navigation and Safety (GANS) and Global Air Traffic Management (GATM) requirements. Then, it will look at the issues in terms of

service parochialism and acquisition and suggest two possible courses of action. The paper will conclude by covering possible outcomes if the DoD continues with business as usual and what the consequences might be, then indicate some areas where further study is required.

Statement of the Problem

The purpose of this report is threefold. First, it will illustrate the clear and concise direction provided by *Joint Vision 2010* toward organizing training and equipping the mobility forces for future conflict. Second, it will detail why the mobility force requirements are acquisitions essential to *Joint Vision 2010* implementation. Finally, it will illustrate a symptom of a problem within the entire acquisition system: the lofty goals of *Joint Vision 2010* may be unachievable by 2010 because the current DoD acquisition system is fraught with inter-service parochialism. This system forces inter-service competition to *win* limited funding for programs which should be joint systems.

II. Literature Review and Background

Introduction to Joint Vision 2010

As mentioned in Section I, *Joint Vision 2010* (*JV 2010*) is a conceptual template which prescribes how the U.S. military will fight in the 21st century. Unlike the joint publications, *JV 2010* is not directive in nature. The Joint Staff constructed the document as a *purple* (Joint) view of the future which fully reflected the end of the Cold War and disappearance of the primary Soviet/Warsaw Pact enemy. This purple view addressed the changes in the strategic environment, including technological trends and their effects on four operational concepts: dominant maneuver, precision engagement, full-dimensional protection and focused logistics. Each of these concepts is built on proven competencies and focuses the development of future joint capabilities. Then, examining six critical elements (people, leadership, doctrine, training, structure and materiel), *JV 2010* assessed the challenges associated with implementing the vision.

The core goal of *JV 2010* is a, "joint force–persuasive in peace, decisive in war, preeminent in any form of conflict," designed to complement the foreign and security policies of the United States (19:2). The fundamental strategic concept of this future joint force is power projection enabled by an overseas presence. *Joint Vision 2010* states that, "Power projection from the United States, achieved through rapid global mobility, will enable the timely response critical to our deterrent and warfighting capabilities,"(19:4-5). This concept reflects that the Armed Forces are smaller than at any time in the past 40 years and have a decreased presence overseas. The key to future

effectiveness will be seamlessly integrated, combined arms organized with minimal redundancy and maximum capability. In order to achieve this, the document points out, "We must be fully joint: institutionally, organizationally, intellectually, and technically," and be able to integrate efficiently with allied partners (19:9). The Armed Forces must also rely on their ability to establish and maintain information superiority, a feat that is technologically possible if they successfully institutionalize a joint mindset.

Before retiring from the Army, Chairman Shalikashvili charged the Joint Staff Deputy Director for Operational Plans and Interoperability (J-7), Major General Close, with ensuring *JV 2010* becomes a reality (14). Since then, support for *JV 2010* has blossomed. Congress, individual Department of Defense (DoD) programs and commercial companies use the document as a *high-level* authority to justify their programs' future existence. The new Chairman of the Joint Chiefs of Staff, General Shelton, has stressed the importance of focusing on the future, as illustrated in the joint vision. General Shelton prods the services toward that end through the J-7 staff.

One tool used to herd the efforts is the Joint Warfighting Science and Technology Plan (JWSTP). This plan recognizes technological superiority as a cornerstone of national military strategy and stresses the importance of maintaining a technological edge. The Science and Technology (S&T) master plans are designed to be responsive to *JV 2010* by providing guidance for the S&T community's warfighting and acquisition strategies and the military services' budget and Program Objective Memorandum (POM) preparation. It focuses on four generic, high priority decision-making considerations: affordability, dual use, accelerated transition and strong technology base (7:Sec I, 1-2). Together with the DoD Basic Research Plan and the Defense Technology Area Plan, the

JWSTP takes a joint perspective to ensure the S&T program supports priority future warfighting capabilities.

The Joint Requirements Oversight Council (JROC), chaired by the Vice-Chairman of the Joint Chiefs of Staff, has "Endorsed this JWSTP planning process and methodology," (7:Sec I, 3). In short, this process design is supposed to ensure the needs of the joint warfighter are weighted above individual Service needs and then supported in the planning, programming and budget activities. These needs are translated into requirements and through the respective services incorporated in the POM and eventually into the budget. An example of this flow can be seen in Fig 1. "The ultimate objective of the (DoD) PPBS is to provide the best mix of forces, equipment, and support within fiscal constraints" (6).

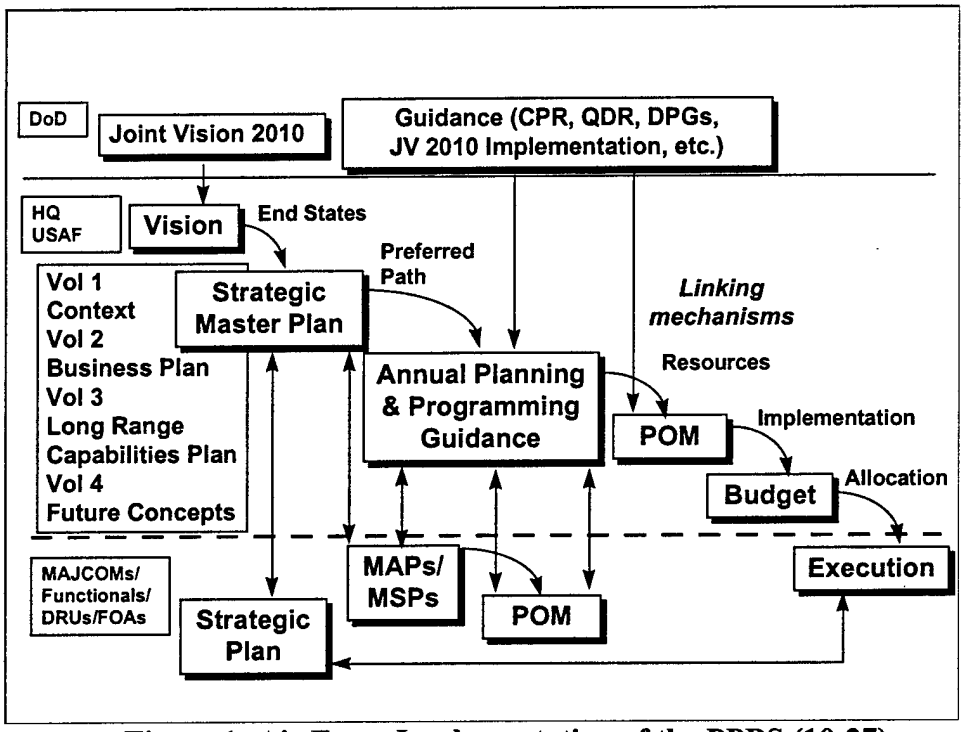

Figure 1: Air Force Implementation of the PPBS (10:27)

The diagram shown in Figure 1 stratifies the levels at which actions and plans occur. The individual Services interpret *JV 2010s* goals into requirements, apply the current capabilities assessments illustrated in the Chairman's Program Review (CPR), the Quadrennial Defense Review (QDR) and Defense Planning Guidance (DPG). If capabilities are insufficient, the Services generate a requirements list of programs that will enable goal fulfillment. The Services, in this case the Air Force, create a Vision. After the Vision is created, the Air Force develops a Strategic Master Plan (SMP) to provide the framework for implementing the Vision. The SMP is updated every two years. Recognizing that changes will occur in between the two-year cycle, the Air Force develops Annual Planning and Programming Guidance (APPG). The Major Commands, like Air Mobility Command, Program Functional Experts, Direct Reporting Units and Field Operating Agencies build a Mission Area Plan (MAP) and a Mission Support Plan (MSP) which are used as inputs to the POM. The POM details a prioritized wish list of programs requiring funding. The budget is a conduit for channeling fiscal requests through the Executive branch to Congress which allocates the money. The lower tier organizations (MAJCOMs, etc.) take the money and execute the programs in accordance with the POM.

Unfortunately, there is never enough money to buy everything on the wish list, so once these requirements are generated, the Services prioritize them according to need. The JROC's function is to provide guidance for integrating capabilities and prioritizing Research and Development (R&D) or acquisition. Part of that job entails reviewing, "Deficiencies in capability that may necessitate new major defense acquisition programs, to include validating key performance parameters and design review," (4:Sec A, 4).

Joint Vision 2010 is very clear that rapid strategic mobility will be the cornerstone of all future military operations regardless of their position on the spectrum of conflict. The Air Force uses that guidance when developing the Air Force Vision and consequently, passes that guidance on to the Major Commands. Air Mobility Command understands the role mobility plays in any future military deployment and on their most recent acquisition wish list, placed Global Air Traffic Management modifications required for Global Access, Navigation and Safety as the number three priority (15). Responding to the change in need, the JROC partially validated funding requirements for GANS initiatives (15).

Introduction to Global Access, Navigation and Safety (GANS)

Global Access, Navigation and Safety (GANS) is an Air Force management tool, not a program, established in April 1997 to coordinate the requirements, acquisition and funding of GANS programs and initiatives in a manner that eliminated traditional - stovepipe solutions. The end-result of this fully coordinated effort should minimize cost of, and down time for, modifications required as a result of the GANS component programs, while maximizing operational capability gained per dollar spent. The seven component programs are: Global Air Traffic Management (GATM), Navigation and Safety Equipment, Joint Precision and Landing System (JPALS), Navigation Warfare (NAVWAR), Air Traffic Control and Landing System (ATCALS), Avionics Modernization and Global Positioning System 2000.

The Global Positioning System (GPS) is the enabling technology that promulgated the need for this effort. Two main factors contributed to its necessity. First, Congress Passed a Law in 1994 which required, "After Sep 30, 2000, funds may not be obligated to modify or procure any DoD aircraft, ship, armored vehicle or indirect fire weapon system that is not equipped with a GPS receiver," (11:4). The second factor is the explosion of commercial technologies, ahead of DoD, which exploit the advantages of the GPS. Due to its technological advantages and global nature, the interest in GANS is spread among all of the Armed Forces.

Some of the GANS programs received partial funding. Most notably, the Navigation and Safety Equipment portion received money as a direct result of the CT-43 aircraft crash in Bosnia which killed Secretary of Commerce Ron Brown and his staff. Phase I of this program accelerates GPS installation on all passenger carrying aircraft and Flight Data Recorder/Cockpit Voice Recorder (FDR/CVR), Emergency Locator Transmitter (ELT), Traffic Collision Avoidance System (TCAS) and Ground Proximity Warning System (GPWS) on all Distinguished Visitor (DV), Presidential Wing aircraft and all Operational Support Aircraft (OSA). Phase II installs this equipment on the remaining passenger carrying aircraft and is scheduled for inclusion in the FY 99/FY00 POM (11:5).

Another GANS initiative, JPALS, has been validated as a joint acquisition program. The System Program Office (SPO) is in place and functional, but the program does not have any production funding. It is scheduled for initial operational capability in 2001 and is expected to be fully operational capable in 2010 (11:6). This equipment will replace the aging Instrument Landing System (ILS) commonly used to precisely guide

aircraft in for landing during inclement weather. The other precision approach used by DoD and NATO aircraft is the Precision Approach Radar (PAR). The PAR is the NATO standard approach, and as of now, it is unclear if JPALS will replace the PAR as the new standard (1:Sec C, 4).

Navigation Warfare is a concept designed to protect friendly use of GPS signals in an Electronic Warfare environment and simultaneously deny enemy use without disrupting civil access to the signal. This task is monumental and is a very real concern for all of the Services because the GPS signal can be jammed very easily (11:7).

The Air Traffic Control and Landing Systems initiatives are an important aspect of GANS because these systems represent a partnership between the FAA and DoD to modernize the National Airspace System and the National Air Traffic Architecture. The modernization efforts include new communication technologies which take advantage of the clarity of digital voice, improved approach surveillance radar for non-precision approaches to airfield in inclement weather and supervision of military air operations (11:15). Future military requirements call for a deployable ATCALS for use when setting up bare-base operations in-theater.

The avionics modernization requirements are an offshoot of the specific requirements that fall under the GANS umbrella. Essentially, the antiquated cockpits of all but the most modern aircraft must be updated to accommodate the new GPS and surveillance systems. Items such as the Inertial Navigation and Flight Management Systems (INS/FMS) are constructed out of hardware that can not integrate successfully with the new software based equipment. The software-based equipment is essential because in theory it only requires a programmatic update to keep the box(es) functioning

should the underlying system change whereas a hardware-based system requires a completely new box. This measure is expected to save long-term dollars through commonality and upgradeability (11: 14). It should also provide ease of expansion as other desired capabilities become feasible, like Real-Time Information in the Cockpit (RTIC).

Knowing what each of the GANS programs does makes it easy to see how each Service will be affected, all to a varying degree, if the initiatives are not adopted. Some are more urgent than others and will, no doubt, be prioritized accordingly. Despite the high interest levels in the GANS components, only one, GATM, received above-guidance money in the Program Objective Memorandum (POM). As mentioned in the introduction, GATM is a time-phased plan to revise the global airspace structure. Since the military must fly in affected airspace the airplanes must be modified with new equipment to prevent exclusion from air traffic system.

Global Air Traffic Management (GATM)

The need for a better air traffic system is driven by two factors: the dramatic increase in air traffic realized in the recent past and the navigation aid decommissioning schedule. Currently, the Federal Aviation Administration projects dramatic increases in air travel growth. This claim is based on a study which projects U.S. aviation revenue passenger miles to double from the 1996 total of approximately 600 million to almost 1.2 billion by 2011 (11:10). To address this increase in traffic, the civil aviation authorities began planning a new route structure predicated on GPS as an enabling technology to

safely decrease separation of aircraft restrictions and thus allowing a greater quantity of traffic through a given volume of airspace.

The second driver is derived from the first. Since GPS adequately serves as the base of the new route structure, then the navigation aids used by the current structure should be phased out. The current plan calls for all non-GPS-based navigation aids to be shut down by 2010 (11:10).

In order to seamlessly fly into and out of the new airspace structure the air fleet must be modified in three areas, communication, navigation and surveillance. Global Air Traffic Management was originally known as Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM) until the Air Force changed its name to reflect its global nature (9:1). Changes in communication requirements arising from the fact that increased traffic will result in more pilots needing to talk to controllers, has driven a need for reduced spacing between radio channels and the addition of a datalink capability. Radios currently in military aircraft (including newer digital types) will be unable to tune to all frequencies required for global flight because the international community, differing from the Federal Aviation Administration, decided to implement an 8.33 kHz space between voice channels on Very High Frequency (VHF) radios. None of the military's aircraft is capable of receiving the 8.33 kHz channel spacing the ICAO adopted. As a result, GATM requirements include new digital radios capable of tuning to global frequency standards and data transfer.

Another key radio-based cost driver was a decision to gradually eliminate civil support for Ultra High Frequency (UHF) radios. The KC-135, for example, has two UHF radios, but only one Very High Frequency (VHF) radio. When the civil UHF support

ends, the KC-135 will not have a backup radio system to communicate with air traffic controllers. Without a backup radio, the entire fleet may not be allowed to use high-density airspace. Antiquation of UHF radios in the civil sector means the 600-plus KC-135 fleet will need to have all new radios installed – a tremendous cost!

Navigation requirements are changing rapidly as well and are the driving force behind the reduced separation requirements. Reduced Vertical Separation Minima (RVSM) are feasible because new technologies, GPS primarily, enable pilots to identify their exact three-dimensional position with a greater degree of accuracy than was ever possible. Accordingly, the in-flight separation standards between aircraft will be reduced. Currently, there are several different rules based on an aircraft's position in the context of the air traffic control environment, radar-controlled airspace, uncontrolled airspace and high-traffic oceanic airspace. In order to reduce the separation between aircraft safely, the civil aviation authorities introduced Required Navigation Performance (RNP) parameters.

Required Navigation Performance is a minimum standard of position certainty in relation to an approved flight path (9:7). For example, current RNP parameters require aircraft flying with two Inertial Navigation Systems (INS) to maintain the equipment so the position will only drift two nautical miles per hour when flying in airspace void of navigation aids. Under RNP-4, the proposed specification for oceanic routes, current INS-based performance would impose a two-hour maximum flight duration restriction on aircraft (9:7). It currently takes almost double that time to cross the North Atlantic.

The third dimension, altitude, has exacting requirements also. Most altimeters can be calibrated to fair standards of accuracy, but this device relies on a source of pitot-static air to determine the correct atmospheric pressures. The problem is that the pitot-static air source can be clogged with debris or ice, making altimeter readings unreliable. To counter this, newer aircraft have two sources of pitot-static air with an altimeter for each source so the readings may be compared. Currently, only a portion of the mobility fleet can meet these parameters. Again, the backbone of the air refueling fleet, the KC-135, is a notable exception because it only has one pitot-static system, it must undergo a costly update to be plumbed for another. A pictorial view of the reduced separation standard can be seen in Figure 2.

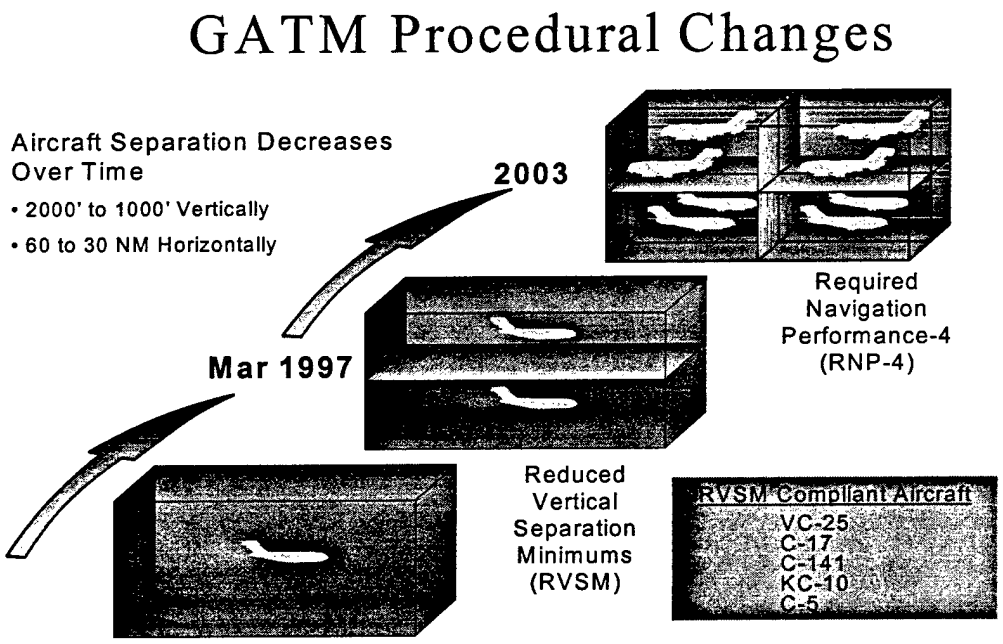

Figure 2: Reduced Vertical Separation Minima

The surveillance technologies civil aviation authorities will rely on to safely insure safe separation of aircraft provide two main functions: airborne collision

avoidance and an automatic position reporting system. It is essential that equipment purchased for these tasks be interoperable with civilian systems. The civilian aviation community is committed to decrease aircraft separation restrictions as navigation tolerances become more precise. That means their requirements will change as the technologies are enhanced and for the DoD means ease of upgrade capability must be added to the already costly list of hardware needs.

Non-compliance is a fundamental issue of why this is a joint concern. *JV 2010* requires the mobility community to be prepared for global deployment at a moment's notice. The effects of non-compliance are dramatic. Essentially, non-compliant aircraft (including the 600+ tanker fleet) will not be able to take advantage of optimal great circle routings at fuel-efficient altitudes. They will be forced into circuitous routing if they desire to take advantage of the fuel-efficient altitudes. The other alternative is to travel on the great circle routes, but at altitudes so low, that increased fuel consumption will negate the advantage of having done so. The implications for the joint warfighter is lost time. Figure 3 illustrates this point using a notional Gulf War deployment and assumes full Civil Reserve Air Fleet (CRAF) participation. Each sortie might be subject to a 90 minute delay factor due to slipped takeoff times as aircraft await limited timeslot entry into the air traffic system, less than optimal routing adding flight duration to cover the greater distances and arrival entry time delays. With that 90 minute delay, it would take an extra 42 days to deliver 100% of the required equipment (12). The delays to estimated closure make this a very real problem for the combatant commanders as they try to implement *JV 2010*.

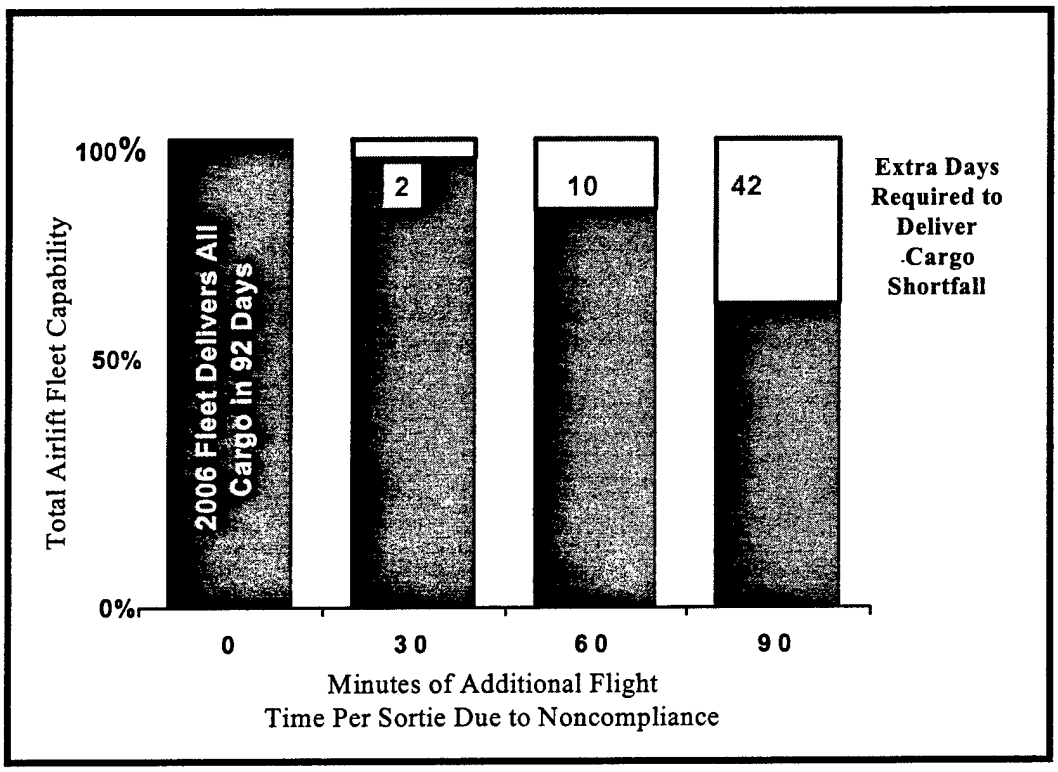

Figure 3: Effect of Non-Compliance on Force Closure

III. Issues

Introduction

Employing a joint mindset toward *JV 2010* implementation may be the toughest challenge because the military does not possess a good track record of successful system and process integration. One only has to reflect upon lessons from previous conflicts. In Vietnam and Grenada, there were several cases where communication systems could not talk to each other. In Vietnam, incompatible FM radios introduced unnecessary havoc in the system as ground controllers were often unsuccessful in coordinating close air support. In Grenada, a resourceful soldier used a pay phone to call his unit in the CONUS to arrange for naval fire support for his team from the warships off the coast because the Army radio sets could not communicate with Naval equipment. These anecdotal examples illustrate an important point: the Services have to coordinate equipment research, development and acquisition in order to affordably realize the technologies required to achieve full spectrum dominance.

There is one instance where the military does not have a choice, but to pursue integrated R&D and production strategies – interoperability with the civilian arena. U.S. reliance on rapid global mobility as the foundation of the power projection strategy detailed in *JV 2010* is the perfect example to illustrate this point. The future airspace environment is changing. Taking advantage of technological innovations like the Global Positioning System (GPS), the civilian aviation authorities are changing the airspace structure to accommodate more air traffic. Since Air Mobility Command planners intend

to use that structure to facilitate rapid deployability, the DoD must modify all of its aircraft to keep pace with the technologies the civilian companies are employing. Because the civilian environment is driving the need to modify DoD aircraft, the cheapest way to comply with the new requirements is to buy Commercial Off The Shelf (COTS) products for that equipment not requiring a unique military capability.

Commonality of need and interoperability requirements for both civilian and military capabilities provides an opportunity for the various branches of the Armed Forces to pool resources in order to minimize duplication of effort and waste. This concept must be exploited because in the bigger picture, the Congress can not afford to pay for extraneous expenses. They have other obligations and commitments and with political pressure to keep taxes low or even decrease them, the Department of Defense is obligated to prepare for future threats in the most efficient way possible.

Future threat analysis shows the DoD must be increasingly reliant on rapid global mobility tied together by efficient Command, Control, Communications, Computers and Intelligence (C4I).. Unfortunately, the way the Defense prioritization system is organized, the services vigorously defend any spending authority Congress approves because no branch is ever willing to lose their fair share of Total Obligation Authority (TOA). The result is what might seem like petty bickering between the services over seemingly trivial matters as each struggles to communicate the vitality of their individual requirements. The JROC partially validated GATM requirements and named the Air Force as the lead acquisition agency. The Systems Project Office (SPO) leading this effort at Hanscom AFB is currently pursuing a least cost COTS strategy.

Commercial Off The Shelf

In December of 1997, the National Defense Panel, comprised of highly respected civilian and military (active duty, reserve and retired) people released a report of their investigation into evolving U.S. national security needs in the 21st century entitled Transforming Defense. Their work suggested a transformation strategy to prepare for those security needs, and among the proposals was a revamped acquisition process that would be both responsive and efficient. The old acquisition process, developed to optimize complex Cold War weapons procurements, was a lengthy strategy optimized to avoid error. The new acquisition process must encourage "the exploration of new concepts and ideas" (22:75) and enable new technology to get to the field much quicker than ever before.

The new process, they contend, should avoid large investments in infrastructure and long production runs by relying increasingly on commercially available products while developing only military-specific requirements. Implementing this process is required where GATM is concerned because the civilian sector is already far ahead of the DoD and forcing us to catch up. One part, the surveillance technologies, is based on the civilian Traffic Collision Avoidance System (TCAS). Others include upgrades to the High Frequency (HF) radios, autopilots and flight management systems. The current plan is to buy these using Commercial Off The Shelf acquisition strategies and so far, the other Services have agreed to this (13).

Joint Acquisition

When a unique military requirement exists however, the acquisition will be much more programmatic. An example of a unique military requirement for GATM is the datalink. Future GATM requirements include a datalink between aircraft and the controlling agency to facilitate clear routing instructions and requests without tying up the airwaves with voice traffic. The DoD is simultaneously exploring satellite datalink capabilities through the Air Force's Joint Tactical Information Distribution System (JTIDS) and the Army/Marine Corps development of a Tactical Internet. Should these functions be combined in the same equipment?

Current technology does not allow these to be combined because the services chose different standards for message composition. JTIDS was designed to provide real-time air battle management using a 70-bit message format. The Tactical Internet was designed to provide real-time ground battle management using a variable length message format. The civilian standard will be different from both (21). As of yet, no agency has explored the possibility that an aircraft might need all three capabilities (13). There might be a scenario where that is required though.

In early 1997, a formation of C-17 aircraft departed Pope AFB in North Carolina on a 17-hour sortie to Kazakhstan to demonstrate an airdrop of Army personnel and equipment. Such direct delivery sorties are integrated in the Army and Air Force airdrop doctrine and future sorties will need datalink capabilities with the Air Traffic Control structure, the air battle managers and the ground battle managers. It is not hard to imagine a future conflict requiring CONUS originated precision aerial delivery of troops

and equipment halfway around the world. The problem generating the need for all three systems on the mobility platform is the civilian requirements and the fact that over the course of a 17 hour sortie, both the ground and air pictures will change requiring in-flight planning flexibility. Can the civilian and military datalinks be combined? It might be technologically possible, but the DoD system can not be combined. The problem is the Services will probably not give up their own programs willingly.

Examples of Joint Acquisition

Even though it will be more structured, program development, experiments, tests, demonstrations and buy orders should be accomplished jointly when applicable. Two examples of this are fairly well known. The first is a joint acquisition success story, the Joint Primary Aircraft Training System, or JPATS. The other, Boeing's V-22, is not a true success story.

The JPATS selection came at a time when acquisition was ripe for change. Both the Navy and the Air Force primary pilot training aircraft are old and costly to maintain. As a result, both services started looking for replacement aircraft at roughly the same time. The Under Secretary of Defense for Acquisition Reform, Colleen Preston, saw an opportunity with this issue to implement a joint acquisition program. The source selection team analyzed a variety of Navy, Air Force and political requirements including a Presidential mandate to train more female pilots. The Raytheon Corporation entry answered the requirements, including the anthropometric standards dictated by having a wider range of body types in the student pilot force, and was selected by then Secretary

of the Air Force, Sheila Widnall. Ultimately, the Air Force and Navy will buy over 700 of the JPATS aircraft achieving an economy of scale that would not have been realized under separate service programs (2). The Air Force, desiring to replace the Cessna, T-37 earlier will buy more of the initial production runs, while the Navy will buy the later production runs.

The other example of joint acquisition is arguably a failure – the Bell/Boeing V-22. The advanced, tilt-rotor technology aircraft acquisition serves as an excellent example of very different needs. The Marine Corps and Special Operations branches of the DoD both desired to take advantage of operational capabilities the tilt-rotor aircraft provides. The source selection team awarded the program contract to a Bell – Boeing consortium. The company though was tasked to do the impossible. The Marines and Special Operators had different needs. The contractor was supposed to answer them both with one aircraft and the costs became prohibitive. The result of very long delays and project rework will be two different aircraft – the CV-22 and the MV-22.

The lesson from this is that similar requirements among Services should be combined into a joint acquisition program. The JROC must determine when the requirements diverge enough that the acquisition program will lead to different results and unnecessary costs. As mentioned before, GATM is unique because the civilian changes are driving the need for the DoD. **ALL** DoD aircraft must eventually comply with the new civil requirements in order to fly. The question now is whether the JROC can force the Services to procure the same equipment?

Funding programs through the JROC to a lead acquisition agency makes the process highly political and is a direct contributor to the political infighting that pits one

program against another in such a fashion that the services get consumed with defending their fair share of the TOA pie. Each Service typically argues the differences in requirements necessitate separate programs. This argument does not necessarily result in DoD purchase of the right equipment for the warfighter. According to Dr. Rebecca Grant, President of IRIS Independent Research, this is one of the major reasons the JROC, prior to 1993-1994, was largely a rubber stamp, validating whatever the service chiefs demanded. Dr. Grant indicated that General Shalikashvili recognized this deficiency and charged the JROC to properly validate requirements in relation with his vision for Joint Warfighting. Since that time, the process has shed its perfunctory status and assumed a valid role in systems procurement, but still does not provide the proper incentive for the services to achieve *JV 2010* goals (16).

In an effort to prevent the validation process from becoming a rubber stamp again, General Shalikashvili signed a charter of JROC responsibilities. This charter, Chairman of the Joint Chiefs of Staff Instruction 5123.01 (CJCSI 5123.01), authorizes the JROC to identify all warfighting deficiencies and resolve all cross-Service requirements issues (4:Sec A, 1-2). The JROC must adjudicate requirements, distinguishing between uniqueness and commonality while, "fulfilling the needs and eliminating the deficiencies of the combatant commands while ensuring interoperability, reducing parallel and duplicate efforts, and promoting economies of scale," (4:Sec A, 1-2). Where requirements are common among the services, the JROC will establish one Service to lead the acquisition program. Where GATM is concerned, the Air Force was designated lead agency. However, the other services are not required to buy through the Air Force System Project Office.

Cost

The price tag associated with GANS initiatives is steep. The estimate for six of the seven initiatives is expected to total $15.5 billion, less the cost of the avionics modernization, for the Air Force alone. GATM costs alone will be approximately $11.4 billion (18:5). The Air Force, unable to pay for these systems immediately, began a phased implementation program focusing on weapon systems requiring immediate upgrades. This strategy might cause problems for the other Services as they begin their fleet upgrades. In order to achieve the best price for the COTS contracts, the manufacturers will want assurances regarding the number of modifications required, and the type equipment required. Without guidance requiring all Services to buy through the Air Force SPO, the contract costs will probably not be as low as possible, requiring an unnecessary waste of scarce procurement dollars.

Business as Usual

The current acquisition and funding process is broken. However, a bona fide alternative may not exist, in which case business must continue as usual. Continuing business as usual relies on each Service creating a an *order of merit* wish list related to the areas for which they have Title 10, U.S. Code, responsibility. The prioritization lists are forwarded to the JROC where they must compete against the other lists for TOA. Once TOA allocations are decided, all is not lost if a Service missed the funding cut on a particular program. Other opportunities exist for each program to earn off-cycle money, but that process is even more subjective, **especially if the program is not communicated in a fashion that garners support outside of the sponsoring Service**.

Every once in a while the system will work correctly. A recent example of a good solution through this process is the Army and Navy's Joint Modular Lighterage System (JMLS). Lighterage is the equipment used to create floating bridges, ferries and transfer stations by the Army in the Joint Logistics-Over-The Shore (JLOTS) program and by the Navy for supporting Marine Corps beachhead operations. As has been the point in this paper, current equipment, although similar, may be completely incompatible because it had different requirements and was purchased at different times (prioritization). However, this program was identified as vital and designated *Joint* by the JROC. The different requirements were hammered out, the major issue being sea state capability of the equipment – how big a wave could be yet leave the platform stable. The Army needed Sea State 2 and the Navy needed Sea State 3 – both Sea State definitions were based on different indexes. The result of the *Joint* designation is a tremendous savings in

modular lighterage procurement even though the Army got equipment sturdier than it required. In these scenarios, paying for something you do not need is a necessary evil in pursuit of a greater good.

IV. Conclusion

What Remains for Tomorrow

In the early 1990s, General Shalikashvili surveyed the landscape and together with his staff created Joint Vision 2010 which clearly and concisely marks the appropriate parameters for planners to follow as they pave the yellow brick road to the future. The road will be paved with a series of programs designed to achieve purple warfighter needs. Unfortunately those programs will be paid with dollars allocated through a system that, although tweaked, was not designed to buy equipment jointly.

Some argue the prioritization system, as it currently exists, does this adequately by weeding out programs that are not affordable, appropriate or timely uses of limited resources. In a perfect, logical world, uninfluenced by political motivations, that may be true. This world is not perfect however and the politics change over time.

The DoD potentially has an apolitical honest broker in the Joint Requirements Oversight Council. In that role, the JROC must have free rein to adjudicate, validate and prioritize the joint warfighting needs of the combatant commanders. The Defense Department has never been able to afford redundant acquisitions, and therefore, can not afford to let GATM acquisition fall out as an Air Force only requirement. GATM should be identified as a joint program necessary for successful achievement of *JV 2010.*

Future Study

The U.S. Armed Forces are at a crossroads again and the methodology they choose will have far-reaching effects over their ability to implement the lofty goals envisioned by *JV 2010.*

An area requiring study is the acquisition manager's responsibility of establishing aggressive, but realistic objectives for all programs by trading off performance and schedule goals to minimize cost. This balancing act too often conflicts with service prioritization needs and results in each service claiming to have different requirements. Removing cost as an independent variable from the system might allow the senior decision makers and acquisition corps to make better decisions about which programs should be procured Joint and which should be procured individually by service based on need.

After all, 2010 is only 11 years away, the Future Years Defense Plan already accounts for the next five and the *JV 2010* update is due in three years. The Department of Defense, as a steward of public trust, has an obligation to spend public money in a manner that achieves the best value for the taxpayers. This calling demands a concerted effort to banish traditional service parochialism in exchange for inter-service understanding and recognition of purple acquisition needs.

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Vita

Captain William Brou Gautier was born on 09 August 1965 in Gulfport, Mississippi. He graduated from Ocean Springs High School in 1983 and entered undergraduate studies at the United States Air Force Academy in Colorado Springs, Colorado. He graduated with military distinction and a Bachelor of Science degree in May 1987.

His first assignment after undergraduate pilot training at Williams AFB was Charleston AFB, SC as a C-141B flight examiner and special operations low level (SOLL) II pilot in the 16th Airlift Squadron. After his selection for the Air Mobility Command's PHOENIX REACH Crossflow program he was assigned to Fairchild AFB as KC-135R/T Chief Aircrew Training and instructor pilot for the 97th Air Refueling Squadron. While at Fairchild AFB, he was selected for Air Mobility Command's PHOENIX HORIZON Advanced Studies of Air Mobility program. In June 1997, he entered the Air Force Institute of Technology. Upon graduation, he will be assigned to Headquarters United States Air Force/Directorate of Plans and Programs, Global Mobility Division (AF/XPPM) at the Pentagon.

Permanent Address: 420 Jackson Avenue
Ocean Springs, Mississippi 39564

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Joint Vision 2010 illustrates a yellow brick road to future warfighting capability that is built on a solid foundation of strategic mobility. At the same time, the global airspace structure is undergoing a fundamental change that will severely limit the United States Armed Forces' ability to carry out the types of air mobility operations Joint Vision 2010 describes. So, it is incumbent upon the individual services to follow that plan with a bona fide purple acquisition process for all programs required to pave the road. Only in this way can the Department of Defense truly ensure fully capable air mobility operations such that combatant commanders can deter aggression and, if necessary, wage and win war in support of United States national security objectives.

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